PRELIMINARY DESIGN CHECKLIST - BRIDGE

Date: 1-1-2018

County:_____ **Design No.:**_____ **Check By:**_____ **Date:**_____

Project Location:_____ **Consultant:**_____

GENERAL

Abbreviations

___ Use as needed. Reference [BDM 13.1.4]

Title Block

___ "Design for (xx Skew) (RA)(LA)"

___ Structure Type and Size and Beam Type (Ex.: "304'-0 x 40'-0 Prestressed Pretentioned Concrete Beam Bridge")

___ For bridge with multi-project staging, the structure width listed should be the width of the current stage plus all previously completed stages. (Ex.: if stage 1 construction is 20 ft. and stage 2 construction is 30 ft., the first project title block should show 20 ft. and the second project title block should show 50 ft.) Show text: Stage 1, Stage 2 as-needed

___ Span Description (Ex "101'-0 End Spans", "102'-0 Center Span")

___ For bridge on horizontal curve, show 'Radius = xxxx'

___ Station of bridge at center of bridge (offset needed for duals). Include roadway (Ex.: "US 30 – Ramp D")

___ Current TSL Date (Ex.: "December 2010")

___ County

___ "Iowa Department of Transportation - Highway Division"

___ "Design Sht. No. x of x", "File No.", "Design No."

___ Situation Plan

Location

___ Location: Road over road/stream

___ Railroad Crossing: For replacement RR bridges use existing Federal Railroad Administration No. (FRA). For new bridges FRA will be assigned later. The Iowa Crossing Number is no longer being used.

___ Township/Range (Ex.: "T-87N", "R-2W")

___ Section (Ex.: "36")

___ Latitude/Longitude (6 decimal) at station of bridge at center of bridge (Ex.: "12.345678/-12.345678")

___ County

___ Bridge Maintenance Number – Show if known

___ FHWA No.: New number shall be provided and shown

Traffic Estimate

___ Traffic Data as shown in Road Plans – see CADD cell

Vertical Profile Data

___ Vertical curve data – include sta/elev of g1/g2 end points

Horizontal Profile Data

___ Horizontal curve data

Vertical Clearance Table

___ Include station/offsets/elevation (overhead/underpass), deck thickness, haunch, beam depth, vertical clearance. Submit data if on super elevation

Utilities List Block

___ Utilities - add legend table and label each for all utilities shown on plan sheet

Recoverable Berm Location Table

___ Recoverable berm location table - show if necessary

Berm Slope Location Table

___ Berm slope location table

Hydrology & Hydraulic Data

___ Hydraulic data table – see data cell for appropriate application

Berm Slope Armoring

___ For stream projects, provide typical section showing embedded vs. non-embedded grading surface (Ex "2'-0 Class E Revetment (Embedded)"). Show Revetment Quantities Table for bridge over waterway – see CADD cell for details. Show and label grading surface (Ex "Grading Surface")

Ground Control Grading

___ Provide coordinates and elevations if applicable

Signature Block

___ Consultant PE signature for Hydrology & Hydraulics – bridge over water/new RCB (does not include extensions)

Staging

___ Staging sequence details if required

Railroad Bridges

___ Show macadam stone protection

___ Minimum horizontal clearance dimension to pier

___ For RR overpass provide heavy construction pier if center track to face column is less than 25'

___ Show fence if required

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___ Add note stating fence type (curved - sidewalk/trail or straight – shoulder only)

___ UP/BNSF RR bridge - use 3'-8 barrier rail

___ UP/BNSF RR bridge - assume 10:1 transition for barrier rail, as taller rail is required

___ UP/BNSF RR bridges - do not add fence on bridge barrier rail unless required

___ UP/BNSF RR bridge - include standard sheet 1067

Notes (include as-needed)

___ "Non-Standard Abutment Wing Wall"

___ "Standard Bridge (Index No.)"

___ "TL - # Bridge Railing Proposed" (use for all bridges)

___ "2-Span Grading Shown" (see EW 203/204 - 5' offset)

___ "Top of bridge deck at centerline roadway is 'x' above (or below) the profile grade to account for deck cross slope and parabolic crown"

___ "Top of bridge deck crown 'X' below profile grade"

___ "Pier Type – (Frame, T, Pile Bent, Diaphragm, etc.)"

___ Collision Force Design – use applicable note for road over road condition

- "Pier(s) designed for vehicular collision force"
- "Pier(s) exempt from vehicular collision force design"

___ "Beam Type – (BTB, etc.) (AASHTO A, B, etc.) (WPG – include depth)"

___ "Provide vent hole in beam"

___ "Class (B, E, etc.) revetment stone is (embedded or non-embedded)".

___ "As this project requires a sovereign lands permit, bid item reference notes shall restrict broken concrete as a substitute for revetment." [BDM 3.2.7.3.5]

___ "Bridge aesthetics to be incorporated during final design"

___ "An Iowa DNR Flood Plain Construction Permit is required"

___ "An Iowa DNR Sovereign Lands Permit is required"

___ "Abutment slopes to be confirmed during final design

Miscellaneous

___ North arrow

___ Scale bar

___ Bench Mark – Use coordinates/description per plan set

___ Border: "County", "Project No.", Sht. No. x of x"

___ Situation Plan Sheets – See Guideline details for Situation, Site and Misc. Plan. For dual bridges, Site and Misc. Plan for each bridge to reflect unique information, notes and leveling.

___ Show bridge cross section – fully dimension, show lanes, shoulders, deck cross slopes, beams, etc.

___ Bridge deck cross slopes to match through lane cross slopes. Shoulder slope to match adjacent lane slope.

___ Zone of Intrusion – verify dimensions/details when this situation applies

PLAN VIEW

___ Bridge Dimensions

- Show 'Face to Face of Paving Notches' dimension
- Show 'Centerline to Centerline Abutment Bearings' dimension
- Show 'Span #' and per span dimension
- Show proposed stations along centerline of approach roadway or baseline approach roadway at piers/abutments

___ Dimensions adjusted for horizontal and grade length within spans differing greater than 1/2 inch for PPCB bridges.

- Horizontal length stationing is measured from centerline to centerline abutment bearings and centerline to centerline spans. Label 'Horizontal Dimensions'.
- Grade length is measured for individual spans and bridge length along the grade from centerline to centerline abutment bearings and face to face paving notch (normal to grade). Label 'Along Grade Dimensions'. [LRFD BDM 1.7.2 and Figures]

___ Show face of paving notch (where approach pvmt adjoins bridge) as color number 15 in CAD Structures Model

___ Roadway designation(s)

___ Typical Approach Roadway Section - dimension lane/shoulder widths and show cross slopes

___ Trail/Sidewalk on Bridge Deck:

- To control water runoff on the bridge, verify whether a raised grade or on-grade trail/sidewalk is required based on an urban vs rural approach section and roadway vs stream crossing.
- Show clear opening dimension on bridge and insure that rail attached to barrier does not encroach on required width
- Typically show 10" wide TL-4 separation barrier across bridge
- Show appropriate parapet/fencing

___ Berm slope armoring - Show station/offset limits

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___ POT stationing of mainline roadway construction centerline and side-road intersection

___ Skew angle – show actual in plan view and design skew in Title Block to nearest degree

___ Minimum vertical clearance location

___ Minimum horizontal clearance dimension to pier

___ Show assumed pier width (roadway vs grade separation)

___ Label guardrail – “Guardrail”

___ Arrows for direction of traffic

___ Dimension variable width bridges at abutments

___ Bridge abutment wing wall dimension shown if non-standard length used

___ Structures with no side piers – dimension berm toe offset

___ Ground elevations preferred for bridges, label contours if used

___ Existing utilities (fence-lines, tiles); label - fiber optic/gas line/etc.

___ Existing structures (bridge, culverts); label - type/size/station and design number

___ Other proposed structures (bridge, culverts) shown on TSL sheets; label - type/size/station and design number

- If structure not part of project (paren) or a tied project, also add ‘Not Part Of This Contract’ (Use this option for dual bridges, staged bridges unless let together or tied)
- If structure part of project (paren) or a tied project with different design number, also add ‘See Design ????’

___ Dimension side road lane and shoulder widths

___ Proposed roadway embankment shaping use 3:1 replacement projects, 3.5/1 new construction

___ Proposed berm and channel shaping

___ Label all centerlines and profile grade lines

___ Label stationing on at least two “tic” marks in the plan view

___ Stream name and direction of flow

___ Check text/dimensioning legible and not placed on top of other details

LONGITUDINAL SECTION

___ Bottom of footing elevation

___ Slope protection: label type, thickness

___ Existing ground line and proposed grade line shown/labeled

___ Existing structure – substructure, piling (from as-built plans)

___ Berm slope labeled (2.5:1 max, Normal)

___ Vertical clearance – actual location and dimension

___ Top of berm elevation at abutments

___ Stream bed elevation

___ Q ‘Design’ water surface elevation as per H&H Data information

___ Scour elevations – Typically use Q200

___ Abutment/pier deck elevations along the centerline of approach roadway

___ Regulatory and Operational Low Beam – see definitions. CADD - Point to elevation locations and label ‘Regulatory Low Beam’ and ‘Operational Low Beam’ but do not include elevation.

___ Prebore Holes - Integral Abutments: show prebore holes 10’-0 deep from bottom of footing and 1’-4 diameter along centerline of abutment footing for bridge lengths greater than 130 feet. Dimension diameter and bottom of prebore hole elevation. Stub Abutments: not required.

CADD CHECKLIST

___ Use current Micro Station V8 Tools and Documentation files as shown under Automation Tools on IaDOT web site.

___ ProjectWise – Follow current guidelines as published by IaDOT including Prelim Deliverable Format found at http://www.iowadot.gov/bridge/v8docs.htm

Micro-Station File and Model Naming Convention

- The file is named STR_county/route/paren_design firm_IaRCS Zone.dgn (i.e. STR_42065042_DOT_Z04.dgn or STR_42065042_ XYZCRP_Z04.dgn) where the paren number is for the project. Always use three digits for the route and paren number using a preceding zero when necessary.
- The model name containing the preliminary layout of the structures is STR_Prelim_Pipes or STR_Prelim_Designs. These models provide separation of the pipes and the designed bridges and culverts for use by Office of Design and final bridge designers.
- Model names for each TSL within the project area of the STR file are named TSL_county_design number (i.e. TSL_42_0399). Always use four digits for the design number using a preceding zero when necessary.
- For multiple TSL sheets for any one structure/design number, add an _01, _02, etc. to the end of the model name (i.e. TSL_42_0110_01, TSL_42_0110_02, etc.).